

I CLAIM:

1. A composition comprising:  
a demulsifying amount of a demulsifier effective to perform a function  
selected from the group consisting of demulsifying an emulsion in an  
aqueous solution and preventing formation of an emulsion in an  
aqueous solution;  
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a first solubilizing quantity of a solubilizing surfactant effective to solubilize  
said demulsifier in said aqueous solution; and  
a second solubilizing quantity of a mutual organic solvent effective to  
solubilize said demulsifier and said solubilizing surfactant to produce  
said composition.
2. The composition of claim 1 wherein said demulsifier is an ionic  
surfactant.
3. The composition of claim 1 wherein said solubilizing surfactant is a  
non-ionic surfactant.
4. A composition comprising:  
a demulsifying amount of an ionic surfactant effective to perform a function  
selected from the group consisting of demulsifying an emulsion in an  
aqueous solution and preventing formation of an emulsion in an  
aqueous solution;  
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a first solubilizing quantity of a non-ionic surfactant effective to solubilize  
said ionic surfactant in said aqueous solution; and

a second solubilizing quantity of a mutual organic solvent effective to solubilize said demulsifier and said solubilizing surfactant to produce said composition.

5. The composition of claim 1 wherein said aqueous solution is a brine.
6. The composition of claim 2 wherein said aqueous solution is a brine.
7. The composition of claim 3 wherein said aqueous solution is a brine.
8. The composition of claim 4 wherein said aqueous solution is a brine.
9. A composition comprising:

a demulsifying amount of an ionic surfactant having the following general formula:



wherein

$R^1$ ,  $R^2$ ,  $R^3$  and  $R^4$  independently are selected from the group consisting of hydrogen and straight chain or branched alkyl groups having from about 1 to about 20 carbon atoms, and heterogeneous and substituted forms thereof comprising one or more atoms selected from the group consisting of oxygen, sulfur, and nitrogen; and

$R^5$  is selected from the group consisting of alkyl groups, aryl groups, aralkyl groups and alkaryl groups wherein the alkyl portions of any of these groups have from about 1 to about 20 carbon atoms;

a first solubilizing quantity of a solubilizing surfactant effective to solubilize said ionic surfactant in said aqueous solution; and

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a second solubilizing quantity of a mutual organic solvent effective to solubilize said demulsifier and said solubilizing surfactant to produce said composition.

10. The composition of claim 2 wherein said ionic surfactant has the following general formula:



wherein

$R^1$ ,  $R^2$ ,  $R^3$  and  $R^4$  independently are selected from the group consisting of hydrogen and straight chain or branched alkyl groups having from about 1 to about 20 carbon atoms, and heterogeneous and substituted forms thereof comprising one or more atoms selected from the group consisting of oxygen, sulfur, and nitrogen; and

$R^5$  is selected from the group consisting of alkyl groups, aryl groups, aralkyl groups and alkaryl groups wherein the alkyl portions of any of these groups has from about 1 to about 20 carbon atoms.

11. The composition of claim 2 wherein said ionic surfactant is a 2-propanamine salt of dodecyl benzene sulfonic acid.

12. The composition of claim 4 wherein said ionic surfactant has the following general formula:



wherein

$R^1$ ,  $R^2$ ,  $R^3$  and  $R^4$  independently are selected from the group consisting of hydrogen and straight chain or branched alkyl groups having from about 1 to about 20 carbon atoms, and heterogeneous and substituted forms thereof comprising one or more atoms selected from the group consisting of oxygen, sulfur, and nitrogen; and

$R^5$  is selected from the group consisting of alkyl groups, aryl groups, aralkyl groups and alkaryl groups wherein the alkyl portions of any of these groups has from about 1 to about 20 carbon atoms.

13. The composition of claim 4 wherein said ionic surfactant is a 2-propanamine salt of dodecyl benzene sulfonic acid.

14. A composition comprising:

a demulsifying amount of a demulsifier effective to perform a function selected from the group consisting of demulsifying an emulsion in an aqueous solution and preventing formation of an emulsion in an aqueous solution;

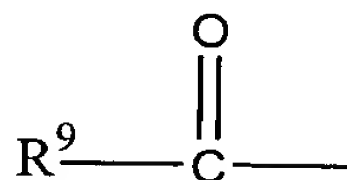
a first solubilizing quantity of a non-ionic surfactant effective to solubilize said demulsifier in said aqueous solution, said non-ionic surfactant comprising an alkoxylated compound having the following general

formula:  $R^6O(CH_2CHR^7O)_xR^8$

wherein

$R^6$  independently is selected from the group consisting of hydrogen, acyl groups and alkyl groups having from about 1 to about 22

carbon atoms, said acyl groups having the following general formula:



wherein  $\text{R}^9$  is an alkyl group having from about 1 to about 24 carbon atoms;

$\text{R}^7$  independently is selected from the group consisting of hydrogen and alkyl groups having from about 1 to about 6 carbon atoms;

$\text{R}^8$  is selected from the group consisting of hydrogen and alkyl groups having from about 1 to about 6 carbon atoms;

and

x is from about 1 to about 20; and

a second solubilizing quantity of a mutual organic solvent effective to solubilize said demulsifier and said solubilizing surfactant to produce said composition.

15. The composition of claim 14 wherein

$\text{R}^6$  is an alkyl group having from about 8 to about 16 carbon atoms; and, x is from about 2 to about 20.

16. The composition of claim 15 wherein

$\text{R}^6$  is a linear alkyl group having from about 14 to about 15 carbon atoms; and x is from about 5 to about 10.

17. The composition of claim 14 wherein said non-ionic surfactant has a hydrophilic-lipophilic balance (HLB) value of from about 5 to about 20.

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18. The composition of claim 14 wherein said non-ionic surfactant has a HLB value of about 8 to about 15.

19. The composition of claim 15 wherein said non-ionic surfactant has a hydrophilic-lipophilic balance (HLB) value of from about 5 to about 20.

20. The composition of claim 15 wherein said non-ionic surfactant has a HLB value of about 8 to about 15.

21. A composition comprising:

a demulsifying amount of a demulsifier effective to perform a function selected from the group consisting of demulsifying an emulsion in an aqueous solution and preventing formation of an emulsion in an aqueous solution;

a first solubilizing quantity of a solubilizing surfactant effective to solubilize said ionic surfactant in said aqueous solution; and

a second solubilizing quantity of a mutual organic solvent effective to solubilize said demulsifier and said solubilizing surfactant and to produce said composition, said mutual organic solvent comprising one or more water soluble alkanol ethers having the formula

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wherein

$R^{10}$ ,  $R^{11}$  and  $R^{12}$  independently are selected from the group consisting of hydrogen and alkyl groups having from about 1 to about 6 carbon atoms; and  
 $z$  is from about 1 to about 22.

22. The composition of claim 21 wherein

$R^{10}$  and  $R^{11}$  are hydrogen atoms;

$R^{12}$  is selected from the group consisting of methyl, ethyl, propyl, iso-propyl, and butyl groups;

$z$  is from about 1 to about 8.

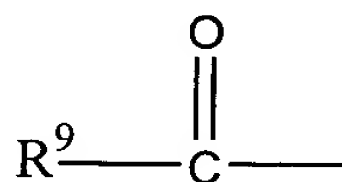
23. The composition of claim 1 wherein said mutual organic solvent is selected from the group consisting of ethylene glycol monobutyl ether (EGMBE) and ethylene glycol monomethyl ether (EGMME).

24. The composition of claim 21 wherein said solubilizing surfactant is an alkoxylated compound having the following general formula:



wherein,

$R^6$  independently is selected from the group consisting of hydrogen, acyl groups and alkyl groups having from about 1 to about 22 carbon atoms, said acyl groups having the following general formula:



wherein  $R^9$  is an alkyl group having from about 1 to about 24 carbon atoms; and,

x is from about 1 to about 30;

$R^7$  independently is selected from the group consisting of hydrogen and alkyl groups having from about 1 to about 6 carbon atoms;

$R^8$  is selected from the group consisting of hydrogen and alkyl groups having from about 1 to about 6 carbon atoms;

z is from about 1 to about 20.

25. The composition of claim 24 wherein

$R^6$  is an alkyl group having from about 8 to about 16 carbon atoms; and,

x is from about 2 to about 20.

26. The composition of claim 25 wherein

$R^6$  is a linear alkyl group having from about 14 to about 15 carbon atoms; and

x is from about 5 to about 10.

27. The composition of claim 24 wherein said non-ionic surfactant has a hydrophilic-lipophilic balance (HLB) value of from about 5 to about 20.

28. The composition of claim 24 wherein said non-ionic surfactant has a HLB value of about 8 to about 15.

29. The composition of claim 25 wherein said non-ionic surfactant has a hydrophilic-lipophilic balance (HLB) value of from about 5 to about 20.

30. The composition of claim 25 wherein said non-ionic surfactant has a HLB value of about 8 to about 15.

31. The composition of claim 9 wherein said aqueous solution is a brine.

32. The composition of claim 14 wherein said aqueous solution is a brine.



33. The composition of claim 21 wherein said aqueous solution is a brine.

34. A composition comprising:

a demulsifying amount of an ionic surfactant effective to perform a function selected from the group consisting of demulsifying an emulsion in an aqueous solution and preventing formation of an emulsion in an aqueous solution;

a first solubilizing quantity of a non-ionic surfactant effective to solubilize said ionic surfactant in said aqueous solution; and

a second solubilizing quantity of a mutual organic solvent comprising one or more water-soluble alkanol ethers having the formula



wherein

$R^{10}$ ,  $R^{11}$  and  $R^{12}$  independently are selected from the group consisting of hydrogen and alkyl groups having from about 1 to about 6 carbon atoms; and

$z$  is from about 1 to about 22.

35. The composition of claim 34 wherein

$R^{10}$  and  $R^{11}$  are hydrogen;

$R^{12}$  is selected from the group consisting of methyl, ethyl, propyl, iso-propyl, and butyl groups;

$z$  is from about 1 to about 8.

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36. The composition of claim 34 wherein said mutual organic solvent is selected from the group consisting of ethylene glycol monobutyl ether (EGMBE) and ethylene glycol monomethyl ether.

37. The composition of claim 34 wherein said ionic surfactant has the following general formula:



wherein

$R^1$ ,  $R^2$ ,  $R^3$  and  $R^4$  independently are selected from the group consisting of hydrogen and straight chain or branched alkyl groups having from about 1 to about 20 carbon atoms, and heterogeneous and substituted forms thereof comprising one or more atoms selected from the group consisting of oxygen, sulfur, and nitrogen; and

$R^5$  is selected from the group consisting of alkyl groups, aryl groups, aralkyl groups and alkaryl groups wherein the alkyl portions of any of these groups has from about 1 to about 20 carbon atoms.

38. The composition of claim 34 wherein said ionic surfactant is a 2-propanamine salt of dodecyl benzene sulfonic acid.

39. The composition of claim 34 wherein said non-ionic surfactant has a hydrophilic-lipophilic balance (HLB) value of from about 5 to about 20.

40. The composition of claim 34 wherein said non-ionic surfactant has a HLB value of about 8 to about 15.

41. A composition comprising:

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a demulsifying amount of an ionic surfactant effective to perform a function selected from the group consisting of demulsifying an emulsion in an aqueous solution and preventing formation of an emulsion in an aqueous solution;

a first solubilizing quantity of a non-ionic surfactant effective to solubilize said ionic surfactant in said aqueous solution, wherein said non-ionic surfactant is an alkoxyated compound having the following general

formula: 
$$R^6O(CH_2CHR^7O)_xR^8$$

wherein

$R^6$  independently is selected from aryl groups and alkyl groups having from about 1 to about 22 carbon atoms;

$R^7$  is independently selected from the group consisting of hydrogen and alkyl groups having from about 1 to about 6 carbon atoms;

$x$  is from about 1 to about 30; and

a second solubilizing quantity of a mutual organic solvent for said ionic surfactant and said non-ionic surfactant.

42. The composition of claim 41 wherein

$R^6$  is an alkyl group having from about 8 to about 16 carbon atoms; and,  $x$  is from about 2 to about 20 moles.

43. The composition of claim 42 wherein

$R^6$  is a linear alkyl group having from about 14 to about 15 carbon atoms; and  $x$  is from about 5 to about 10.

44. The composition of claim 41 wherein said mutual organic solvent comprises one or more water soluble alkanol ethers having the formula



wherein

$R^{10}$ ,  $R^{11}$  and  $R^{12}$  independently are selected from the group consisting of hydrogen and alkyl groups having from about 1 to about 6 carbon atoms; and preferably from 1 to about 4 carbon atoms; and  $z$  is from about 1 to about 22.

45. The composition of claim 44 wherein

$R^{10}$  and  $R^{11}$  are hydrogen;

$R^{12}$  is selected from the group consisting of methyl, ethyl, propyl, iso-propyl, and butyl groups;

$z$  is from about 1 to about 8

46. The composition of claim 41 wherein said mutual organic solvent is selected from the group consisting of ethylene glycol monobutyl ether (EGMBE) and ethylene glycol monomethyl ether.

47. The composition of claim 41 wherein said ionic surfactant has the following general formula:



wherein

$R^1$ ,  $R^2$ ,  $R^3$  and  $R^4$  independently are selected from the group consisting of hydrogen and straight chain or branched alkyl groups having from about 1 to about 20 carbon atoms, and heterogeneous and substituted forms thereof comprising one or more atoms selected from the group consisting of oxygen, sulfur, and nitrogen; and

$R^5$  is selected from the group consisting of alkyl groups, aryl groups, aralkyl groups and alkaryl groups wherein the alkyl portions of any of these groups has from about 1 to about 20 carbon atoms.

48. The composition of claim 41 wherein said ionic surfactant is a 2-propanamine salt of dodecyl benzene sulfonic acid.

49. The composition of claim 41 wherein said non-ionic surfactant has a hydrophilic-lipophilic balance (HLB) value of from about 5 to about 20.

50. The composition of claim 41 wherein said non-ionic surfactant has a HLB value of about 8 to about 15.

51. The composition of claim 42 wherein said ionic surfactant has the following general formula:



wherein

$R^1$ ,  $R^2$ ,  $R^3$  and  $R^4$  independently are selected from the group consisting of hydrogen and straight chain or branched alkyl groups having from about 1 to about 20 carbon atoms, and heterogeneous and substituted forms thereof comprising one or more atoms selected from the group consisting of oxygen, sulfur, and nitrogen; and

$R^5$  is selected from the group consisting of alkyl groups, aryl groups, aralkyl groups and alkaryl groups wherein the alkyl portions of any of these groups has from about 1 to about 20 carbon atoms.

52. The composition of claim 42 wherein said ionic surfactant is a 2-propanamine salt of dodecyl benzene sulfonic acid.

53. The composition of claim 42 wherein said non-ionic surfactant has a hydrophilic-lipophilic balance (HLB) value of from about 5 to about 20.

54. The composition of claim 42 wherein said non-ionic surfactant has a HLB value of about 8 to about 15.

55. A composition comprising  
a demulsifying amount of ionic surfactant having the following general formula:



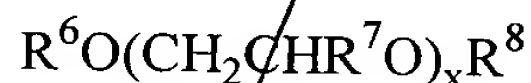
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wherein

$R^1$ ,  $R^2$ ,  $R^3$  and  $R^4$  independently are selected from the group consisting of hydrogen and straight chain or branched alkyl groups having from about 1 to about 20 carbon atoms, and heterogeneous and substituted forms thereof comprising one or more atoms selected from the group consisting of oxygen, sulfur, and nitrogen; and

$R^5$  is selected from the group consisting of alkyl groups, aryl groups, aralkyl groups and alkaryl groups wherein the alkyl portions of any of these groups have from about 1 to about 20 carbon atoms;

a first solubilizing quantity of a non-ionic surfactant effective to solubilize said demulsifier in an aqueous solution, said non-ionic surfactant comprising an alkoxylated compound having the following general formula:



wherein

$R^6$  independently is selected from aryl groups and alkyl groups having from about 1 to about 22 carbon atoms;

$R^7$  is independently selected from the group consisting of hydrogen and alkyl groups having from about 1 to about 6 carbon atoms; and

$z$  is from about 1 to about 20; and

a second solubilizing quantity of a mutual organic solvent comprising one or more water soluble alkanol ethers having the formula



wherein

$R^{10}$ ,  $R^{11}$  and  $R^{12}$  independently are selected from the group consisting of hydrogen and alkyl groups having from about 1 to about 6 carbon atoms; and preferably from 1 to about 4 carbon atoms; and

$z$  is from about 1 to about 22.

56. The composition of claim 55 wherein

$R^{10}$  and  $R^{11}$  are hydrogen;

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$R^{12}$  is selected from the group consisting of methyl, ethyl, propyl, iso-propyl, and butyl groups;

z is from about 1 to about 8.

57. The composition of claim 55 wherein said ionic surfactant is a 2-propanamine salt of dodecyl benzene sulfonic acid.

58. The composition of claim 55 wherein said non-ionic surfactant has a hydrophilic-lipophilic balance (HLB) value of from about 5 to about 20.

59. The composition of claim 55 wherein said non-ionic surfactant has a HLB value of about 8 to about 15.

60. The composition of claim 55 wherein  $R^6$  is an alkyl group having from about 8 to about 16 carbon atoms; and, x is from about 2 to about 20.

61. The composition of claim 60 wherein  $R^6$  is a linear alkyl group having from about 14 to about 15 carbon atoms; and x is from about 5 to about 10.

62. The composition of claim 55 wherein said mutual organic solvent is selected from the group consisting of ethylene glycol monobutyl ether (EGMBE) and ethylene glycol monomethyl ether (EGMME).

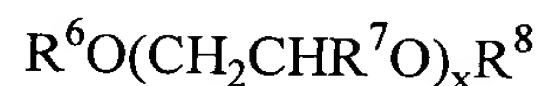
63. A composition comprising:

a demulsifying amount of a 2-propanamine salt of dodecyl benzene sulfonic acid effective to perform a function selected from the group consisting of demulsifying an emulsion in an aqueous solution and preventing formation of an emulsion in an aqueous solution;

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a first solubilizing quantity of an alcohol ethoxylate having the following  
general formula



wherein

$R^6$  is an alkyl group having from about 8 to about 16 carbon atoms;

and,

$x$  is from about 2 to about 20; and

a second solubilizing quantity of a mutual organic solvent selected from the  
group consisting of ethylene glycol monobutyl ether (EGMBE) and  
ethylene glycol monomethyl ether (EGMME).

64. The composition of claim 63 wherein

$R^6$  is a linear alkyl group having from about 14 to about 15 carbon atoms; and  
 $x$  is from about 5 to about 10.

65. The composition of claim 1 wherein

said demulsifying amount of said demulsifier is from about 1 wt.% to about 40

;

said first solubilizing quantity of said solubilizing surfactant is from about 1  
wt.% to about 10 wt.%; and

said second solubilizing quantity of said mutual organic solvent is from about  
60 to about 98 wt.%.  
66. The composition of claim 1 wherein

said demulsifying amount of said demulsifier is from about 2 wt.% to about 10

wt.%; and

said second solubilizing quantity of said mutual organic solvent is from about 85 to about 95 wt.%.

67. The composition of claim 14 wherein said demulsifying amount of said ionic surfactant is from about 1 wt.% to about 40 wt.%;

said first solubilizing quantity of said non-ionic surfactant is from about 1 wt.% to about 10 wt.%; and

said second solubilizing quantity of said mutual organic solvent is from about 60 to about 98 wt.%.

68. The composition of claim 14 wherein said demulsifying amount of said ionic surfactant is from about 2 wt.% to about 10 wt.%; and

said second solubilizing quantity of said mutual organic solvent is from about 85 to about 95 wt.%.

69. The composition of claim 21 wherein said demulsifying amount of said ionic surfactant is from about 1 wt.% to about 40 wt.%;

said first solubilizing quantity of said non-ionic surfactant is from about 1 wt.% to about 10 wt.%; and

said second solubilizing quantity of said mutual organic solvent is from about 60 to about 98 wt.%.

70. The composition of claim 21 wherein said demulsifying amount of said demulsifier is from about 2 wt.% to about 10 wt.%; and

said second solubilizing quantity of said mutual organic solvent is from about 85 to about 95 wt.%.

71. The composition of claim 34 wherein said demulsifying amount of said ionic surfactant is from about 1 wt.% to about 40 wt.%;

said first solubilizing quantity of said non-ionic surfactant is from about 1 wt.% to about 10 wt.%; and

said second solubilizing quantity of said mutual organic solvent is from about 60 to about 98 wt.%.

72. The composition of claim 34 wherein said demulsifying amount of said ionic surfactant is from about 2 wt.% to about 10 wt.%; and

said second solubilizing quantity of said mutual organic solvent is from about 85 to about 95 wt.%.

73. The composition of claim 41 wherein said demulsifying amount of said ionic surfactant is from about 1 wt.% to about 40 wt.%;

said first solubilizing quantity of said non-ionic surfactant is from about 1 wt.% to about 10 wt.%; and

said second solubilizing quantity of said mutual organic solvent is from about 60 to about 98 wt.%.

74. The composition of claim 41 wherein said demulsifying amount of said ionic surfactant is from about 2 wt.% to about 10 wt.%; and

said solubilizing quantity of said mutual organic solvent is from about 85 to about 95 wt.%.

75. The composition of claim 45 wherein said demulsifying amount of said ionic surfactant is from about 1 wt.% to about 40 wt.%; said first solubilizing quantity of said non-ionic surfactant is from about 1 wt.% to about 10 wt.%; and said second solubilizing quantity of said mutual organic solvent is from about 60 to about 98 wt.%.

76. The composition of claim 45 wherein said demulsifying amount of said ionic surfactant is from about 2 wt.% to about 10 wt.%; and said solubilizing quantity of said mutual organic solvent is from about 85 to about 95 wt.%.

77. A composition comprising:  
an aqueous phase; and  
a hydrocarbon phase comprising an ionic surfactant, a non-ionic surfactant, and a mutual organic solvent.

78. A method comprising:  
providing an aqueous solution comprising an oil-in-water emulsion; and  
adding to said oil-in-water emulsion a concentration of a blend effective to resolve said emulsion, said blend comprising:  
a demulsifying amount of an ionic surfactant;

a first solubilizing quantity of a non-ionic surfactant effective to solubilize said ionic surfactant in said aqueous solution; and a second solubilizing quantity of a mutual organic solvent.

79. The method of claim 78 wherein said concentration is from about 0.25 % v./v. to about 3 % v./v.

80. A method comprising:

providing an aqueous solution; and

adding to said aqueous solution a concentration of a blend effective to prevent the formation of an oil-in-water emulsion, said blend comprising:

a demulsifying amount of an ionic surfactant;

a first solubilizing quantity of a non-ionic surfactant effective to

solubilize said ionic surfactant in said aqueous solution; and

a second solubilizing quantity of a mutual organic solvent.

81. The method of claim 80 wherein said concentration is from about 0.25 % v./v. to about 3 % v./v.

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